

ABSTRACT

A method for determining physical properties of micromachined cantilevers used in cantilever-based instruments, including atomic force microscopes, molecular force probe instruments and chemical or biological sensing probes. The properties that may be so determined include optical lever sensitivity, cantilever spring constant and cantilever-sample separation. Cantilevers characterized with the method may be used to determine fluid flow rates. The method is based on measurements of cantilever deflection resulting from drag force as the cantilever is moved through fluid. Unlike other methods for determining such physical properties of cantilevers, the method described does not depend on cantilever contact with a well-defined rigid surface. Consequently, the method may be employed in situations where such contact is undesirable or inconvenient. The method has numerous applications, including molecular force measurements, atomic force microscopy and manipulation technology, chemical or biological sensing, [lithographic manufacturing, nanometer scale surface profiling] and other aspects of nanotechnology.